CLAIMS

1. A charged particle beam irradiation equipment, for applying a charged particle beam to an irradiation area, comprising a scanning electromagnet for deflecting a charged particle beam and a power supply for applying a voltage to the scanning electromagnet, characterized in that the power supply is equipped with a first power supply unit having no filter and a second power supply unit having a filter.

2. A charged particle beam irradiation equipment according to Claim 1, characterized in that:

the charged particle beam irradiation equipment has a control device which, when the charged particle beam is applied to a second irradiation area in the irradiation object after the charged particle beam was applied to a first irradiation area in the irradiation object,

computes a voltage command value that is given to the first power supply unit based on the variation of an exciting current necessary for the scanning electromagnet to move a position where the charged particle beam is applied from the first irradiation area to the second irradiation area and a transit time necessary for the scanning electromagnet to move the position where the charged particle beam is applied from the first irradiation area to the second irradiation area,

computes a voltage command value that is given to the second power supply unit based on an exciting current value necessary for the scanning electromagnet to keep the position where the charged particle beam is applied in the second irradiation area and the resistance of the scanning electromagnet; and

outputs the voltage command values obtained through the computations to the first power supply unit and the second power supply unit; and wherein

the first power supply unit and the second power supply unit output voltages according to the voltage command values outputted by the control device, respectively.

3. A charged particle beam irradiation equipment according to Claim 2, characterized in that

the control device stops output of the voltage command value to the first power supply unit at the point of time when the transit time elapsed after the control device outputted the voltage command value to the first power supply unit, and

the first power supply unit stops output of the voltage when the output of the voltage command value by the control device is stopped.

4. A charged particle beam irradiation equipment, for applying a charged particle beam to an irradiation area,

comprising a scanning electromagnet for deflecting the charged particle beam and a power supply for applying a voltage to the scanning electromagnet, characterized in that

the power supply comprises a first inverter for outputting a DC voltage, a second inverter for outputting a DC voltage connected to the first inverter in series, and a DC filter connected to output ports of the second inverter in parallel, and wherein

the scanning electromagnet is connected to the first inverter and the second inverter in series.

5. A charged particle beam irradiation equipment according to Claim 4, characterized in that

the power supply comprises first control means for controlling the output voltage value of the first inverter, second control means for controlling the output voltage value of the second inverter, and a control device for indicating the output voltage value of the first inverter to the first control means as well as indicating the output voltage value of the second inverter to the second control means; and

wherein, the control device which, when the charged particle beam is applied to the second irradiation area in the irradiation object after the charged particle beam was applied to the first irradiation area in the irradiation object,

computes a voltage value based on the variation of the exciting current necessary for the scanning electromagnet to move the position where the charged particle beam is applied from the first irradiation area to the second irradiation area and the transit time necessary for the scanning electromagnet to move the position where the charged particle beam is applied from the first irradiation area to the second irradiation area; and

computes a voltage value that is indicated to the second control means based on the exciting current value necessary for the scanning electromagnet to keep the position where the charged particle beam is applied in the second irradiation area and the resistance of the scanning electromagnet, and

outputs the voltage values obtained through the computations to the first control means and the second control means, respectively; and wherein

the first control means and the second control means control the output voltage values of the first inverter and the second inverter, respectively, according to the voltage values indicated by the control device.

6. A charged particle beam irradiation equipment according to Claim 5, characterized in that

the control device stops the output of the voltage value to the first control means at the point of time when the transit

time elapsed after the control device outputted the voltage value to the first control means, and

the first control means sets the first inverter to be in a short-circuit condition when the voltage value by the control device is stopped.

7. A charged particle beam irradiation equipment according to Claim 5, comprising a current detector for detecting the exciting current flowing in the scanning electromagnet, characterized in that the control device which

compares the exciting current detected by the current detector and the exciting current value necessary for the scanning electromagnet to keep the position where the charged particle beam is applied in the second irradiation area, and

stops the output of the voltage value to the first control means at the point of time when the exciting current value detected by the current detector reaches the exciting current value necessary for the scanning electromagnet to keep the position where the charged particle beam is applied in the second irradiation area, and wherein

the first control means set the first inverter to be in a short-circuit condition when the output of the voltage value by the control device is stopped.

8. A charged particle beam irradiation equipment according to any one of Claim 5 to Claim 7, characterized in that the second control means controls the second inverter in a PWM scheme.

9. A method for controlling charged particle beam irradiation equipment having a scanning electromagnet for controlling an irradiation position of the charged particle beam in an irradiation object by deflecting the charged particle beam, characterized in that after the charged particle beam was applied to a first irradiation area in the irradiation object, the irradiation position of the charged particle beam is changed over to a second irradiation area in the irradiation object while the irradiation of the charged particle beam is being stopped, and subsequently, when the irradiation position of the charged particle beam is changed over to the second irradiation area in case the charged particle beam is applied to the second irradiation area, a voltage whose absolute value is larger than a voltage necessary to keep the irradiation position of the charged particle beam in the second irradiation areas is applied to the scanning electromagnet.

10. A method for controlling the charged particle beam irradiation equipment according to Claim 9, characterized in

that the voltage necessary to keep the irradiation position of the charged particle beam in the second irradiation area equals a product of the exciting current necessary for the electromagnet to keep the irradiation position of the charged particle beam in the second irradiation area and the resistance of the scanning electromagnet.